#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

: 23.09.98 Edition : ISO 4113 Test oil

Combination No. : 0 402 796 039

Injection pump

Pump designation : PES6H110/320RS21 EP type number : 0 412 716 005

Governor

Governer design. : RE36

Governer no. : 0 421 890 373

Cust. part No. : 51.11103-7529

Customer-spec. information

Customer : MAN

: D0826 LF13/LFL09 Motor

: 191.0 Power KW

### TEST BENCH REQUIREMENTS

Inlet line : 3.0

Test oil inlet

40 temp. °C Tolerance °C : **←** 2.0

Overflow valve : 2 417 413 082

Inlet press. bar : 3.0 Tolerance bar : + 0.1

Test nozzle holde

: 1 688 901 103 assembly

Opening pressure

208.5 Tolerance bar : ← 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

x inside diameter: 2.0 600 x length mm :

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

## BEGINNING OF DELIVERY

Test pressure bar: 26.0 Tolerance bar : +- 1.0

Prestroke mm : 8.00 Tolerance mm : + 0.05 Check

tolerance mm : +- 0.10

Rack travel in mm: 10.50 Tolerance mm : ← 0.50

Firing order : 1-5-3-6-2-

: 4

Phasing : 0-60-120-180-240

: -300

Tolerance : **←** 0.50

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : ← 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION
Engine speed min-1: 0
Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check
tolerance mm : +/- 0.30  Stop position (P, R and H pump)
Uact V: Value with deenergised adjusting magnet and control rod in
stop position.  CRT mm : $0.75$ Tolerance mm : $+/-0.25$ Check tolerance mm : $+/-0.35$
Stop position (M pump) Uact V : 0,720

Tolerance Volt : +- 0,065
Tolerance Volt : +- 0,065 CRT mm : 1,00
Starting position
(M pump)
Uact V : 4,500
Tolerance Volt : +- 0,115
CRT mm : 19,00 Tolerance mm : +- 0,80
Total ance min . To 0,00
ENGINE-SPEED SENSOR
(All P and R pumps not
H and M pumps)
Test with control rod
in stop position
The stop position
Engine speed min-1: 60 Amplitude V : 1.4
Amplitude V : 1.4 Tolerance V : +/- 0.6
Check tolerance V : +/- 1.20
Engine speed min-1: 600
Difference
Amplitude to
Amplitude V : max.1.4
(C) INJECTION PUMP WITH POSITIONER
(C) INJECTION PUMP WITH POSITIONER TEST POINT V1
TEST POINT V1 Rated speed rpm : 850
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440
Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440 Prestroke solenoid
Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440 Prestroke solenoid Stroke mm : 9.30
Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440 Prestroke solenoid
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440 Prestroke solenoid Stroke mm : 9.30 Del. quantity cm3/1000 strokes : 206.0 Tolerance
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440 Prestroke solenoid Stroke mm : 9.30 Del. quantity cm3/1000 strokes : 206.0 Tolerance cm3/1000 strokes : +- 6.0
Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440 Prestroke solenoid Stroke mm : 9.30 Del. quantity cm3/1000 strokes : 206.0 Tolerance cm3/1000 strokes : +- 6.0 Check tolerance
TEST POINT V1  Rated speed rpm : 850 Uact V : 2.490 Prestroke solenoid Stroke mm : 11.10 Del. quantity cm3/1000 strokes : 224.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1150 Uact V : 2.440 Prestroke solenoid Stroke mm : 9.30 Del. quantity cm3/1000 strokes : 206.0 Tolerance cm3/1000 strokes : +- 6.0

;		500
:		1.750
ď		
:		9.80
:		<b>135</b> .0
:	+-	5.0
:	+-	9.0
	: d :	: d : : +-

Rated speed rpm	:		<b>70</b> 0
Prestroke solenoi	ď		
Stroke mm	:		9.30
Del. quantity			
cm3/1000 strokes	:		70.0
Tolerance			
cm3/1000 strokes	:	+-	4.0
Check tolerance			
cm3/1000s.	:	+-	8.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000s.	:		8.0

:		<i>30</i> 0
:		1.310
:	+-	0.060
:	$\leftarrow$	0.080
d		
:		11.10
:		26.0
:	+-	3.0
:		7.0
:		11.0
	d :	: ← d

# STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.050
Prestroke soleno	id	
Stroke mm	:	5.50
Del. quantity		
cm3/1000 strokes	:	130.0
Tolerance		
cm3/1000 strokes	: +-	- 8.0

Check tolerance			
cm3/1000s.	:	+-	12.0
			<del></del>

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 23.09.98 : ISO 4113

Combination No. : 0 402 795 203

Injection pump

Pump designation : PES5H120/720/3LS1010

EP type number : 0 412 725 206

Governor

Governer design. : RE33

Governer no. : 0 421 890 371

Cust. part No. : 51.11103-7476

Customer—spec. information

Customer : MAN

Motor

: D 2865 LF 09

Power KW

: 250.0

### TEST BENCH REQUIREMENTS

Inlet line : 4(EHAB)

Test oil inlet

temp. °C

40

Tolerance °C

: +- 2.0

Overflow valve : 2 417 413 073

Inlet press. bar :

3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

208.5

Tolerance bar

: **←** 1.5

Test lines : 1 680 750 089

Outside diameter :

8.0

x inside diameter : 3.0 x length mm :

REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

BEGINNING OF DELIVERY

Test pressure bar :

Tolerance par : +- 1.0

10.00 Prestroke mm :

: +- 0.05 Tolerance mm

Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50

: **←** 0.50 Tolerance mm

Firing order : 1-3-5-4-2

: 0-72-144-216-288 Phasing

: +- 0.50 Tolerance

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance Check

tolerance °NW : +- 0.75

Barrel no. : 5

: +- 0.50

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

CRT mm : 1,00 TESTING & SETTING RACK TRAVEL SENSOR Starting position POSITION (dmuq M) Uact V Engine speed min-1: Tolerance Volt CRT mm Setting point Tolerance mm (P, R and H pump) 13.00 3.100 Uact V CRT mm Tolerance mm : +/- 0.05 H and M pumps) Check : +/- 0.10 tolerance mm Check value in stop position (P, R and H pump) 1.700 Uact V CRT mm 6.15 Check Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Difference Amplitude to Setting point (M pump) Uact V 3,100 CRT mm 12.50 Tolerance mm : +/- 0.05 Check TEST POINT V1 tolerance mm : +/- 0.10 Uact V Check value (M pump) Stroke mm 1.700 Del. quantity Uact V CRT mm 5.50 : +/- 0.25 Tolerance mm Tolerance Check tolerance mm :  $\pm 1/-0.30$ Check tolerance cm3/1000s. Stop position (P, R and H pump) : Value with Rated speed rpm Uact V deenergised adjusting magnet Uact V and control rod in Stroke mm stop position. 0.75 Del. quantity CRT mm : +/- 0.25 Tolerance mm Tolerance Check : +/- 0.35 tolerance mm Check tolerance Stop position cm3/1000s. (M pump) 0,720 Uact V Tolerance Volt : + 0,065

4,500 : +- 0,115 19,00 : : +- 0,80 ENGINE-SPEED SENSOR (All P and R pumps not Test with control rod Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 tolerance V : +/- 1.20 Engine speed min-1: 600 Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER Rated speed rpm : 750 3.350 Prestroke solenoid 10.00 cm3/1000 strokes : 326.0 cm3/1000 strokes :  $\leftarrow$  1.0 : +-FUEL DELIVERY CHARACTERISTICS 1000 3.290 Prestroke solenoid 8.00 cm3/1000 strokes : 306.0 cm3/1000 strokes : +-: +- 8.0 Rated speed rpm : 500

Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: : : : :	+- +-	2.100 6.20 167.0 4.0 8.0
Rated speed rpm Prestroke soleraid	:		700
Stroke mm	:		10.00

Rated speed rpm Prestroke solernic			700
Stroke mm	<b>a</b> :		10.00
Del. quantity cm3/1000 strokes	:		70.0
Tolerance		_	4.0
Check tolerance	•		
cm3/1000s. Spr <del>ee</del> d	:	+	8.0
Tolerance cm3/1000 strokes			5.0
Check tolerance	•		ن.ر
cm3/1000s.	;		9.0

Rated speed rpm	:		300
Uact V	:		1.500
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.080
Prestroke solenoid	t		
Stroke mm	:		7.20
Del. quantity			
cm3/1000 strokes	:		25.0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance			
cm3/1000 strokes	:		8.0
Check tolerance			
cm3/1000S.	:		12.0

## STARTING FUEL DELIVERY

Rated speed rpm Uact V	:	100 2.450
Prestroke solenoi	id	7 00
Stroke mm Del. quantity	;	7.00
cm3/1000 strokes	:	174.0
Tolerance		
cm3/1000 strokes	: +	- 10.0

Check tolerance cm3/1000s. : +- 14.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

: 23.09.98 Edition : ISO 4113 Test oil

Combination No. : 0 402 795 204

Injection pump

Pump designation : PES5H120/720/3LS1011

EP type number : 0 412 725 207

Governor

Governer design. : RE33

Governer no. : 0 421 890 371

Cust. part No: : 51.11103-7538

Customer—spec. information

Customer : MAN

: D 2865 LF 09 Motor

Power KW : 250.0

### TEST BENCH REQUIREMENTS

Inlet line : 4.1

Test oil inlet

40 temp. °C Tolerance °C : + 2.0

Overflow valve : 2 417 413 082

Inlet press. bar : 3.0 Tolerance bar : + 0.1

Test nozzle holde

: 1 688 901 105 assembly

Opening pressure

: 208.5 bar Tolerance bar : +- 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter: 3.0 x length mm : 600

#### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 10.00Tolerance mm :  $\leftarrow 0.05$ 

Check

: +- 0.10 tolerance mm

Rack travel in mm : 10.50

Tolerance mm : +- 0.50

Firing order : 1-3-5-4-2

: 0-72-144-216-288 : +- 0.50 Phasing

Tolerance

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance : +- 0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 5

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR POSITION	- Starting position
	(M pump)
Engine speed min-1: 0	(M pump)  Uact V : 4,500  Tolerance Volt : +- 0,115
Cakking maink	Tolerance Volt : +- 0,115 CRT mm : 19,00
Setting point (P, R and H pump)	+ Tolerance mm : + 0,80
(P, R and h pump)	T Totel ance iiiii . 1 5,50
Uact V : 3.100	+
Uact V : 3.100 CRT mm : 13.00	+ ENGINE-SPEED SENSOR
Tolerance mm : +/- 0.05	+ (All P and R pumps not
Check	+ H and M pumps)
tolerance mm : +/- 0.10	Test with control rod
Check value	in stop position
(P, R and H pump)	+ Stop position
., = =	+ Engine speed min-1: 60
	Amplitude V : 1.4 Tolerance V : +/- 0.6
Uact V : 1.700 CRT mm : 6.15	+ Tolerance V : +/- 0.6
CRT mm : 6.15 Tolerance mm : +/- 0.25	+ Check + tolerance V : +/- 1.20
Check	T toterance v . 77 = 1.20
tolerance mm : +/- 0.30	Engine speed min-1: 600 Difference
	+ Amplitude to
Setting point	+ Amplitude V : max.1.4
(M pump)	†
Uact V : 3.100	I
CRT mm : 12.50	(c) INJECTION PUMP WITH POSITIONER
Tolerance mm : +/- 0.05	+
Check	+ TEST POINT V1
tolerance mm : +/- 0.10	750
Check value	+ Rated speed rpm : 750 + Uact V : 3.350
(M pump)	Prestroke solenoid
	+ Stroke mm : 10.00
Uact V : 1.700	Del. quantity
CRT mm : 5.50	+ cm3/1000 strokes : 326.0
Tolerance mm : +/- 0.25	+ Tolerance
Check tolerance mm : +/~ 0.30	+ cm3/1000 strokes : + 1.0 Check tolerance
totel ance with . 17 - 0.50	+ cm3/1000s. : +- 4.0
Stop position	FUEL DELIVERY CHARACTERISTICS
(P, R and H pump)	+
	+
Uact V : Value with	+ Rated speed rpm : 1000 + Uact V : 3.290
deenergised adjusting magnet and control rod in	+ Uact V : 3.290 + Prestroke solenoid
stop position.	Stroke mm : 8.00
CRT mm : 0.75	Del. quantity
Tolerance mm : +/- 0.25	- cm3/1000 strokes : 306.0
Check	Tolerance
tolerance mm : +/- 0.35	+ cm3/1000 strokes : +- 4.0 + Check tolerance
Stop position	+ cm3/1600s. : + 8.0
(M pump)	+ 0.000
Uact V : 0,720	+
Tolerance Volt : ← 0,065	Rated speed rpm : 500

Uact V	: 2.	100
Prestroke soleno	d	
Stroke mm Del. quantity	: 6	. 20
cm3/1000 strokes	: 16	7.0
Tolerance cm3/1000 strokes	: +-	4.0
Check tolerance	• •	₹.0
cm3/1000s.	: +-	8.0
Rated speed rpm	្ត: 70	0
Prestroke solenoi Stroke mm		.00
Del. quantity	-	
cm3/1000 strokes Tolerance	: 7	0.0
cm3/1000 strokes	: +-	4.0
Check tolerance cm3/1000s.	• +- :	8.0
Spreed	• •	J. <b>J</b>
Tolerance cm3/1000 strokes	:	5.0
Check tolerance	•	J. U
cm3/1000s.	:	9.0
TEST POINT L1		
	30	_
Rated speed rpm Uact V	: 300	) 500
Tolerance Volt	: +- 0.0	
Check tolerance Volt	: +- O.0	ገደቦ
Prestroke solenoi		<i>7</i> 00
Stroke mm	: 7	. 20
Del. quantity cm3/1000 strokes	: 25	5.0
Tolerance		
cm3/1000 strokes Spreed	: +- :	3.0
Tolerance		
cm3/1000 strokes Check tolerance	: 8	3.0
CHECK LULEI GILLE		
cm3/1000s.	: 18	2.0
	: 18	2.0
		2.0 
STARTING FUEL DEL	IVERY	
STARTING FUEL DEL		
starting fuel Del Rated speed rpm Uact V Prestroke solenoi	: 100 : 2.4	) +50
stroke mm	: 100 : 2.4	
starting fuel Del Rated speed rpm Uact V Prestroke solenoi	: 100 : 2.4 d : 7.	) +50 .00
starting fuel Del Rated speed rpm Uact V Prestroke solenoi Stroke mm Del. quantity	: 100 : 2.4 d : 7.	) +50 .00

Check tolerance		1/ 0
cm3/1000s.	_:	 14.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition

: 23.09.98

Test oil

: ISO 4113

Combination No. : 0 402 795 205

Injection pump

Pump designation : PES5H120/720/3LS1013

EP type number : 0 412 725 209

Governor

Governer design. : RE33

Governer no. : 0 421 890 372

Cust. part No. : 51.11103-7540

Customer-spec. information

Customer : MAN

Motor

: D 2865 LUH 07

Power KW

: 228.0

## TEST BENCH REQUIREMENTS

Inlet line : 4.1

Test oil inlet

temp. °C

40

Tolerance °C

: +-- 2.0

Overflow valve : 2 417 413 082

Inlet press. bar :

3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

208.5

bar

Tolerance bar : + 1.5

Test Lines : 1 680 750 089

Outside diameter : 8.0

A10

x inside diameter: 3.0

x length mm : 600

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery

under Section C.

### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : + 1.0

Prestroke mm : 10.00 Tolerance mm : +- 0.05 Tolerance mm : +- 0.05 Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50 Tolerance mm :  $\leftarrow$  0.50

Firing order

: 1-3-5-4-2

: 0-72-144-216-288 Phasing : +- 0.50

Tolerance

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance

: +- 0.50

Check

tolerance °NW

: +- 0.75

Barrel no. : 5

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

CRT mm : 1,00 TESTING & SETTING RACK TRAVEL SENSOR Starting position POSITION (M pump) : 4,500 Uact V Engine speed min-1: Tolerance Volt : +- 0,115 : 19,00 Setting point CRT mm (P, R and H pump) Tolerance mm : +- 0,80 Uact V CRT mm : 3.100 : 13.90 3.100 ENGINE-SPEED SENSOR Tolerance mm : +/- 0.05 (All P and R pumps not H and M pumps) Check : +/- 0.10 tolerance mm Test with control rod in stop position Check value (P, R and H pump) Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 : 1.700 : 6.15 Uact V CRT mm Check Tolerance mm : +/- 0.25 tolerance V : +/- 1.20 Check tolerance mm :  $\pm /- 0.30$ Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 Setting point (M pump) : 3.100 : 12.50 3.100 Uact V (C) INJECTION PUMP WITH POSITIONER CRT mm Tolerance mm : +/- 0.05 TEST POINT V1 Check tolerance mm : +/- 0.10 750 Rated speed rpm : 3.350 Check value Uact V Prestroke solenoid (dmpd M) Stroke mm 10.00 : 1.700 Uact V Del. quantity CRT mm 5.50 cm3/1000 strokes : 332.0 : +/- 0.25 Tolerance mm Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance mm : +/- 0.30 Check tolerance cm3/1000s.: +- 4.0 FUEL DELIVERY CHARACTERISTICS Stop position (P, R and H pump) Rated speed rpm : : Value with 1000 Uact V deenergised adjusting magnet 3.290 Uact V and control rod in Prestroke solenoid stop position. Stroke mm 8.00 : 0.75 Del. quantity CRT mm cm3/1000 strokes : 312.0 Tolerance mm : +/- 0.25 Tolerance Check tolerance mm :  $\pm -0.35$ cm3/1000 strokes :  $\leftarrow$  4.0 Check tolerance Stop position cm3/1000S. : +- 8.0 (M pump) : 0,720 Uact V Tolerance Volt :  $\leftarrow$  0,065 Rated speed rpm : 500

Uact V	:	2.100
Prestroke solenoi	d	
Stroke mm	;	6.20
Del. quantity cm3/1000 strokes		173.0
Tolerance	•	113.0
cm3/1000 strokes	; +-	4.0
Check tolerance cm3/1000s.		8.0
CHIDA TOOOD,	, +-	o.u
	<del> </del>	700
Rated speed rpm Prestroke solenoi	; ~	700
Stroke mm	.;	10.00
Del. quantity		
cm3/1000 strokes	:	70.0
Tolerance cm3/1000 strokes	: +-	4.0
Check tolerance	• •	4.0
cm3/1000s.	: +-	8.0
Spreed		
Tolerance cm3/1000 strokes	:	5.0
Check tolerance	•	3.0
cm3/1000s.	:	9.0
TEST POINT L1		
1201 104111 21		
Rated speed rpm	:	300
Uact V	;	1.500
Tolerance Volt Check tolerance	: +-	0.060
SHOOK COCCIONICE		

Rated speed rpm Uact V Tolerance Volt	:	+	300 1.500 0.060
Check tolerance Volt	:	<b>-</b>	0.080
Prestroke solenoi Stroke mm	d :		7.20
Del. quantity cm3/1000 strokes	:		32.0
Tolerance cm3/1000 strokes	:	+-	3.0
Spreed Tolerance			
cm3/1000 strokes Check tolerance	:		8.0
cm3/1000s.	:		12.0

## STARTING FUEL DELIVERY

Rated speed rpm Uact V	:	100 2.450
Prestroke solenoi	id .	2.450
Stroke mm	:	7.00
Del. quantity cm3/1000 strokes		19E 0
Tolerance	•	185.0
cm3/1000 strokes	; +	- 10.0

Check tolerance			
cm3/1000S.	:	+-	14.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 23.09.98 Test oil : ISO 4113

Combination No. : 0 402 796 040

Injection pump

Pump designation : PES6H120/320RS22 EP type number : 0 412 726 011

Governor

Governer design. : RE36

Governer no. : 0 421 890 373

Cust. part No. : 51.11103-7537

Customer-spec. information

Customer : MAN

Motor : D 0826 LUH 12

Power KW : 162.0

### TEST BENCH REQUIREMENTS

Inlet line : 3.0

Test oil inlet

temp. °C : 40 Tolerance °C : +- 2.0

Overflow valve : 2 417 413 082

Inlet press. bar : 3.0Tolerance bar :  $\leftarrow$  0.1

Test nozzle holde

assembly : 1 688 901 105

Opening pressure

bar : 208.5 Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0 x length mm : 600

#### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

### BEGINNING OF DELIVER?

Test pressure bar : 26.0 Tolerance bar : + 1.0

Prestroke mm : 8.00
Tolerance mm : + 0.05
Check
tolerance mm : + 0.10

Rack travel in mm : 10.50

Tolerance mm : ← 0.50

Firing order : 1-5-3-6-2-

: 4

Phasing : 0-60-120-180-240

: -300

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : + 0.75

Start of delivery blocking

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR POSITION	Stanting position
Engine speed min-1: 0	Uact V : 4,500
Setting point (P, R and H pump)	(M pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10	ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps)
Check value (P, R and H pump)	Test with control rod in stop position
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check	Engine speed min-1: 60  Amplitude V : 1.4  Tolerance V : +/- 0.6  Check  tolerance V : +/- 1.20  Engine speed min-1: 600
tolerance mm : +/- 0.30	<ul><li>Difference</li><li>Amplitude to</li></ul>
Setting point (M pump)	Amplitude V : max.1.4
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10	(C) INJECTION PUMP WITH POSITIONER TEST POINT V1
Check value (M pump)	+ Rated speed rpm : 800 + Uact V : 2.510 + Prestroke solenoid - Stroke mm : 13.20
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30	+ Del. quantity + cm3/1000 strokes : 222.0 + Tolerance - cm3/1000 strokes : + 1.0 + Check tolerance - cm3/1000s. : + 4.0
Stop position (P, R and H pump)	+ FUEL DELIVERY CHARACTERISTICS +
Uact V: Value with deenergised adjusting magnet and control rod in stop position.	Rated speed rpm : 1200 Uact V : 2.540 Prestroke solenoid Stroke mm : 10.30
CRT mm : 0.75  Tolerance mm : +/- 0.25  Check tolerance mm : +/- 0.35	Del. quantity - cm3/1000 strokes : 209.0 - Tolerance - cm3/1000 strokes : +- 6.0
Stop position (M pump)	Check tolerance cm3/1000s. : +- 10.0
Uact V : 0,720 Tolerance Volt : + 0,065	Rated speed rpm : 500

Uact V	: 1.930
Prestroke solenoi	
Stroke mm	: 10.40
Del. quantity	. 1/4 0
cm3/1000 strokes Tolerance	: 146.0
cm3/1000 strokes	: +- 4.0
Check tolerance	
cm3/1000\$.	: ← 8.0
Rated speed rpm	: 700
Prestroke solenoi	d
Stroke mm	: 10.30
Del. quantity cm3/1000 strokes	: 70.0
Tolerance	. 70.0
cm3/1000 strokes	: +- 4.0
Check tolerance	
cm3/1000s.	: ← 8.0
Spreed Tolerance	
cm3/1000 strokes	: 5.0
Check tolerance	
cm3/1000s.	: 9.0
TEST POINT L1	
Rated speed rpm	: 300
Uact V	: 1.440 : +- 0.060
Tolerance Volt Check tolerance	: 0.060
Volt	: ← 0.080
Prestroke solenoie	
Stroke mm	: 8.80
Del. quantity cm3/1000 strokes	: 17.0
Tolerance	. 11.0
cm3/1000 strokes	: ← 3.0
Spreed	
Tolerance cm3/1000 strokes	: 8.0
Check tolerance	. 0.0
cm3/1000s.	: 12.0
STARTING FUEL DELI	TVFRY
TIMILITO FUEL VEL	
Rated speed rpm	: 100
Uact V	: 2.100
Prestroke solenoid Stroke mm	: 7.20
Del. quantity	. 7.20
cm3/1000 strokes	: 104.0
Tolerance	
cm3/1000 strokes	: +- 6.0

Check tolerance cm3/1000s. : +- 10.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 23.09.98 Test oil : ISO 4113

Combination No. : 0 402 796 202

Injection pump

Pump designation : PES6H120/720/3LS1017

EP type number : 0 412 726 213

Governor

Governer design. : RE33

Governer no. : 0 421 890 371

Cust. part No. : 51.11103-7477

Customer-spec. information Customer : MAN
Motor : D 2866 LF 16
Power KW : 294.0

### TEST BENCH REQUIREMENTS

Inlet line : 4(EHAB)

Test oil inlet

temp. °C

Tolerance °C : + 2.0

Overflow valve : 2 417 413 073

Inlet press. bar :

3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

: 208.5

Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0 x length mm : 600

### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 10.00 Tolerance mm : +- 0.05 Check tolerance mm : **←** 0.10

Rack travel in mm : 10.50 Tolerance mm : +- 0.50

Firing order : 6-2-4-1-5-

: 0-60-120-180-240 Phasing

: -300

Tolerance : +- 0.50

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance : +- 0.50

Check

tolerance °NW : **←** 0.75

Barrel no. : 6

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION Engine speed min-1: Setting point (P, R and H pump) : Uact V CRT mm 3.100 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value (P, R and H pump) : 1.700 : 6.15 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm :  $\pm -0.30$ Setting point (M pump) : 3.100 : 12.50 Uact V CRT mm Tolerance mm : +/- 0.05 Check tolerance mm :  $\pm -0.10$ Check value (amua M) : 1.700 : 5.50 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Stop position (P, R and H pump) : Value with Uact V deenergised adjusting magnet and control rod in stop position. 0.75 CRT mm : +/- 0.25 Tolerance mm Check tolerance mm :  $\pm - 0.35$ Stop position (M pump) : 0,720 Uact V

Tolerance Volt :  $\leftarrow$  0,065 1,00 CRT mm Starting position (m pump) Uact V 4,500 Tolerance Volt : ← 0,115 CRT mm : 19,00 : +- 0,80 Tolerance mm ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60 Amplitude V : 1.4 Amplitude V : Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 750 Uact V 3.350 Prestroke solenoid Stroke mm : 10.00 Del. quantity cm3/1000 strokes : 328.0 Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance cm3/1000S. : +- 4.0 FUEL DELIVERY CHARACTERISTICS Rated speed rpm : 1000 Uact V 3.290 Prestroke solenoid 8.00 Stroke mm : Del. quantity cm3/1000 strokes : 308.0 Tolerance cm3/1000 strokes :  $\leftarrow$  4.0 Check tolerance : +- 8.0 cm3/1000s.

Rated speed rpm Uact V	:		500 2,100
Prestroke solenoi Stroke mm	id :		6.20
Del. quantity cm3/1000 strokes	:		168.0
Tolerance cm3/1000 strokes	:	+-	4.0
Check tolerance cm3/1000s.	:	+-	8.0

Rated speed rpm	.:		700
Prestroke solenoid Stroke mm	a :		10.00
Del. quantity cm3/1000 strokes	•		70.0
Tolerance	•		70.0
cm3/1000 strokes	:	+-	4.0
Check tolerance cm3/1000s.	:	+-	8.0
Spreed			
Tolerance cm3/1000 strokes	:		5.0
Check tolerance cm3/1000s.	:		9.0

Rated speed rpm Uact V	:		300 1.500
Tolerance Volt	:	+-	0.060
Check tolerance Volt		+-	0.080
Prestroke solenoid	į	·	
Stroke mm Del. quantity	:		7.20
cm3/1000 strokes	:		25.0
Tolerance cm3/1000 strokes		+-	3.0
Spreed	•	·	3.0
Tolerance cm3/1000 strokes			8.0
Check tolerance	•		
cm3/1000S.	:		12.0

# STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.450
Prestroke solenoi	d	
Stroke mm	:	7.00
Del. quantity		
cm3/1000 strokes	:	177.0
Tolerance		
cm3/1000 strokes	: +	- 10.0

Check tolerance	
cm3/1000s.	: +- 14.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 23.09.98 : ISO 4113

Combination No. : 0 402 796 203

Injection pump

Pump designation : PES6H120/720/3LS1016

EP type number : 0 412 726 212

Governor

Governer design. : RE33

Governer no. : 0 421 890 372

Cust. part No. : 51.11103-7479

Customer—spec. information

Customer : MAN

Motor : D 2866 LUH 21 Power KW : 257.0

### TEST BENCH REQUIREMENTS

Inlet line : 4(EHAB)

Test oil inlet

temp. °C : 40 Tolerance °C :  $\leftarrow$  2.0

Overflow valve : 2 417 413 073

Inlet press. bar : 3.0 Tolerance bar : + 0.1

Test nozzle holde

assembly : 1 688 901 105

Opening pressure

bar : 208.5 Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0 x length mm : 600

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 10.00Tolerance mm :  $\leftarrow 0.05$ 

Check

tolerance mm : <del>←</del> 0.10

Rack travel in mm : 10.50

Tolerance mm : +- 0.50

Tolerance

Firing order : 6-2-4-1-5-

Phasing

: 0-60-120-180-240

: -300

Check

: **←** 0.50

tolerance °NW : + 0.75

## Start of delivery blocking

Tolerance : +- 0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 6

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION

Engine speed min-1:

Setting point (P, R and H pump)

Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 3.100

Check

tolerance mm : +/- 0.10

Check value (P, R and H pump)

Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check

tolerance mm :  $\pm -0.30$ 

Setting point (M pump)

: 3.100 : 12.50 Uact V CRT mm Tolerance mm :  $\pm -0.05$ Check

: +/- 0.10 tolerance mm

Check value (M pump)

Uact V CRT mm : 1.700 : 5.50 Tolerance mm : +/- 0.25

Check

tolerance mm : +/- 0.30

Stop position (P, R and H pump)

: Value with Uact V

deenergised adjusting magnet

and control rod in

stop position.

CRT mm 0.75 Tolerance mm : +/- 0.25

Check

: +/- 0.35 tolerance mm

Stop position

(M pump) Uact V 0,720 :

Tolerance Volt : +- 0,065 CRT mm : 1,00

Starting position

(M pump)

: 4,500 Uact V Tolerance Volt : +- 0,115 CRT mm : 19,00 Tolerance mm : +- 0,80

ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps)

Test with control rod in stop position

Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6

Check

tolerance V : +/- 1.20

Engine speed min-1: 600

Difference Amplitude to

Amplitude V : max.1.4

(C) INJECTION PUMP WITH POSITIONER

TEST POINT V1

750 Rated speed rpm : Uact V 3.350 Prestroke solenoid

: 10.00 Stroke mm Del. quantity

cm3/1000 strokes : 332.0 Tolerance

cm3/1000 strokes :  $\leftarrow$  1.0

Check tolerance

cm3/1000S. : +- 4.0 FUEL DELIVERY CHARACTERISTICS

Rated speed rpm : 1000 Uact V : 3.290

Prestroke solenoid

Stroke mm 8.00 Del. quantity

cm3/1000 strokes : 312.0

Tolerance

cm3/1000 strokes :  $\leftarrow$  4.0

Check tolerance

: +- 8.0 cm3/1000s.

A20

Rated speed rpm	:		500
Uact V	:		2.100
Prestroke solenoi	d		
Stroke mm	:		6.20
Del. quantity			
cm3/1000 strokes	;		173.0
Tolerance			
cm3/1000 strokes	:	+-	4.0
Check tolerance			
cm3/1000s.	;	+-	8.0

Rated speed rpm	:		790
Prestroke solenoid Stroke mm	;		10.00
Del. quantity cm3/1000 strokes	•		70.0
Tolerance	•		
cm3/1000 strokes Check tolerance	:	-	4.0
cm3/1000s.	:	+-	8.0
Spreed Tolerance			
cm3/1000 strokes Check tolerance	:		5.0
cm3/1000s.	:		9.0

Rated speed rpm Uact V Tolerance Volt	:	+-	300 1.500 0.060
Check tolerance Volt	: ــ	+-	0.080
Prestroke solenoi Stroke mm	a :		7.20
Del. quantity cm3/1000 strokes Tolerance	:		33.0
cm3/1000 strokes	:	+-	3.0
Spreed Tolerance			
cm3/1000 strokes Check tolerance	:		8.0
cm3/1000s.	:		12.0

# STARTING FUEL DELIVERY

0
450
.00
5.0
0.0

Check tolerance				
cm3/1000s.	:	+-	14.0	

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 22.09.98 : ISO 4113

Combination No. : 0 402 796 205

Injection pump

Pump designation : PES6H120/720/3LS1015

EP type number : 0 412 726 211

Governor

Governer design. : RE33

Governer no. : 0 421 890 372

Cust. part No. : 51.11103-7541

Customer-spec. information

Customer : MAN

Motor

: D 2866 LUH 21

Power KW

: 257.0

## TEST BENCH REQUIREMENTS

Inlet line : 4.1

Test oil inlet

temp. °C

40

Tolerance °C

: **←** 2.0

Overflow valve : 2 417 413 082

Inlet press. bar :

3.0

Tolerance bar :  $\leftarrow$  0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

208.5

Tolerance bar :  $\leftarrow$  1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

A22

x inside diameter :

3.0

x length mm :

600

## REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting.

Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : Tolerance bar : +- 1.0

Prestroke mm : 10.00 Tolerance mm

: +- 0.05

Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50

Tolerance mm :  $\leftarrow$  0.50

Firing order

: 6-2-4-1-5-

: 3

Phasing

: 0-60-120-180-240

: -300 : +- 0.50

Tolerance Check

tolerance 'NW

: +- 0.75

## Start of delivery blocking

Tolerance

: +- 0.50

Check

tolerance  $^{\circ}NW$  :  $\leftarrow$  0.75

Barrel no. : 6

(B) POSITIONER TESTING

Warm-up time: 3 minutes at

n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,0
TESTING & SETTING RACK TRAVEL SENSOR POSITION	+ Starting position
	(M pump)  Uact V : 4,5  Tolerance Volt : +- 0,1
Engine speed min-1: 0	+ Uact V : 4,5
Satting point	+ Interance volt : +- U,7 + CRT mm : 19,
Setting point (P, R and H pump)	Tolerance mm : +- 0,8
,	+
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05	+
CRT mm : 13.00	+ ENGINE-SPEED SENSOR
Check : 47- 0.03	+ (All P and R pumps not + H and M pumps)
tolerance mm : +/- 0.10	T and 11 parts
	Test with control rod
Check value	† in stop position
(P, R and H pump)	Engine speed min-1: 60
	Amplitude V : 1.4
Uact V : 1.700	Amplitude V : 1.4 + Tolerance V : +/- 0.6
Uact V : 1.700 CRT mm : 6.15	+ Check
Tolerance mm : +/- 0.25	tolerance V : +/- 1.2
Check tolerance mm : +/- 0.30	+ Engine speed min-< 600
tolerance mm : 47- U.SU	+ Engine speed min-₹ 600 + Difference
	+ Amplitude to
Setting point	+ Amplitude V : max.1.4
(M pump)	+
Heat V : 3 100	†
Uact V : 3.100 CRT mm : 12.50	(c) INJECTION PUMP WITH POS
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05	+
Check	+ TEST POINT V1
tolerance mm : +/- 0.10	+
Check value	Rated speed rpm : 750 + Uact V : 3.35
(M pump)	
, ,	Prestroke solenoid Stroke mm : 10.0 Del. quantity cm3/1000 strokes : 332.0
Uact V : 1.700	Del. quantity
CRT mm : 5.50	
Tolerance mm : +/- 0.25 Check	<pre>+ Tolerance + cm3/1000 strokes : ← 1.</pre>
tolerance mm : +/- 0.30	Check tolerance
	+ cm3/1000S. : +- 4.8
Stop position	+ FUEL DELIVERY CHARACTERISTI
(P, R and H pump)	†
Uact V : Value with	Rated speed rpm : 1000
deenergised adjusting magnet	+ Uact V : 3.29
and control rod in	+ Prestroke solenoid
stop position.	+ Stroke mm : 8.0
CRT mm : 0.75	+ Del. quantity
Tolerance mm : +/- 0.25 Check	+ cm3/1000 strokes : 312.0 + Tolerance
tolerance mm : +/- 0.35	- cm3/1000 strokes : +- 4.0
	Check tolerance
Stop position	+ cm3/1000s. : + 8.0
(M pump)	†
Uact V : 0,720 Tolerance Volt : ← 0,065	Rated speed rpm : 500

CRT mm	
CAI IIIII	: 1,00
Stanting position (M pump)	
Uact V	: 4,500
Tolerance Volt	: 4,500 : +- 0,115
CRT mm	: 19,00
Tolerance mm	: +- 0,80
Total and man	
ENGINE-SPEED SENSO	
(All P and R pumps	s not
H and M pumps)	
Test with control	rod
in stop position	
Engine speed min-1	
Amplitude V	: 1.4
Tolerance V	: +/- 0.6
Check	
tolerance V	: +/- 1.20
Engine speed min-	. 600
Difference	•
Amplitude to	
Amplitude V	: max.1.4
(C) INJECTION PUMP	WITH POSITIONER
TEST POINT V1	
Rated speed rpm	: 750
Uact V	: 3.350
Uact V	: 3.350
Uact V	: 3.350
Uact V Prestroke solenoid Stroke mm Del. quantity	: 3.350 1 : 10.00
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes	: 3.350 1 : 10.00
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance	: 3.350 : 10.00 : 332.0
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 3.350 : 10.00 : 332.0
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance	: 3.350 : 10.00 : 332.0 : ← 1.0
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 • ACTERISTICS
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 ACTERISTICS
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V	: 3.350 i 10.00 : 332.0 : ← 1.0 : ← 4.0 ACTERISTICS : 1000 : 3.290
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 **ACTERISTICS : 1000 : 3.290
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid Stroke mm	: 3.350 i 10.00 : 332.0 : ← 1.0 : ← 4.0 ACTERISTICS : 1000 : 3.290
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid Stroke mm Del. quantity	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 **ACTERISTICS : 1000 : 3.290 : 8.00
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 EACTERISTICS : 1000 : 3.290 : 8.00
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 EACTERISTICS : 1000 : 3.290 : 8.00 : 312.0
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 **ACTERISTICS : 1000 : 3.290 : 8.00
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 : ACTERISTICS : 1000 : 3.290 : 8.00 : 312.0 : ← 4.0
Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHAR Rated speed rpm Uact V Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 3.350 : 10.00 : 332.0 : ← 1.0 : ← 4.0 EACTERISTICS : 1000 : 3.290 : 8.00 : 312.0

Uact V	:		2.100
Prestroke solenoid Stroke mm	:		6.20
Del. quantity cm3/1000 strokes	:		173.0
Tolerance cm3/1000 strokes	;	+-	4.0
Check tolerance cm3/1000s.	:	+	8.0
	•		3.4

Rated speed rpm	<u>.</u> :		700
Prestroke solenoid Stroke mm	<b>a</b> :		10.00
Del. quantity cm3/1000 strokes	:		70.0
Tolerance cm3/1000 strokes	•	+-	4.0
Check tolerance	•		8.0
cm3/1000s. Spr <del>ee</del> d	•	-	8.0
Tolerance cm3/1000 strokes	:		5.0
Check tolerance cm3/1000s.	:		9.0

Rated speed rpm	:		300
Uact V	:		1.500
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.080
Prestroke solenoi	d		
Stroke mm	:		7.20
Del. quantity			
cm3/1000 strokes	:		<b>33</b> .0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance			
cm3/1000 strokes	:		8.0
Check tolerance			
cm3/1000\$.	:		12.0

# STARTING FUEL DELIVERY

Rated speed rpm	:	700
Uact V	:	2.450
Prestroke solenoi	d	
Stroke mm	:	7.00
Del. quantity		
cm3/1000 strokes	:	185.0
Tolerance		
cm3/1000 strokes	: +	<del>-</del> 10.0

Check tolerance			
cm3/1000s.	; + <del>-</del>	14.0	

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 15,10,98 : ISO 4113

Combination No. : 0 402 796 827

Injection pump

Pump designation : PES6P120A720RS7356

EP type number : 0 412 726 919

Governor

Governer design. : RE30

Governer no. : 0 421 890 017

Cust. part No. : RE 501867

Customer-spec, information

Customer : DEERE

Motor

: 6081 HH004

Power KW

: 242.0

## TEST BENCH REQUIREMENTS

Inlet line : 4.2

Test oil inlet

temp. °C

40

Tolerance °C

: <del>←</del> 2.0

Overflow valve : 2 417 413 077

Inlet press. bar :

2.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 103

Opening pressure

bar

: 208.5

Tolerance bar : ← 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter :

3.0

x length mm :

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar: 17.0 Tolerance bar : +- 1.0

Prestroke mm : 3.60 Tolerance mm : + 0.05

Check

tolerance mm : ← 0.10

Rack travel in mm : 10.50 Tolerance mm :  $\leftarrow$  0.50

: 1-5-3-6-2-Firing order

Phasing : 0-60-120-180-240

: -300

Tolerance : **←** 0.50

Check

: +- 0.75 tolerance °NW

Start of delivery blocking

\*NW after s.o.d. : 8.50 : **←** 0.50 Tolerance

Check

tolerance  $^{\circ}NW$  :  $\leftarrow$  0.75

Barrel no. : 1

A25

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 VTESTING & SETTING RACK TRAVEL SENSOR POSITION Engine speed min-1: Setting point (P, R and H pump) Uact V : 3.100 CRT mm : 13.00 3.100 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value (P, R and H pump) : 1.700 : 6.15 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Setting point (amuq M) Uact V CRT mm : 3.100 : 12.50 3.100 Tolerance mm : +/- 0.05 Check : +/- 0.10 tolerance mm Check value (qmuq M) : 1.700 Uact V CRT mm 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Stop position (P, R and H pump) : Value with Uact V deenergised adjusting magnet and control rod in

stop position.

0.75

: +/- 0.25

tolerance mm : +/-0.35Stop position (M pump) Uact V : 0,720 Tolerance Volt : ← 0,065 CRT mm : 1,00 Starting position (M pump) : 4,500 Uact V Tolerance Volt : ← 0,115 : 19,00 CRT mm Tolerance mm : +- 0,80 ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 1050 Uact V : 3.030 Del. quantity cm3/1000 strokes : 213.0 Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance cm3/1000S. :  $\leftarrow$  4.0 Spreed Tolerance cm3/1000 strokes : 5.0 Check tolerance cm3/1000s. 9.0 FUEL DELIVERY CHARACTERISTICS Rated speed rpm : 700 Uact V 3.120 Del. quantity cm3/1000 strokes : 237.0

CRT mm

Check

Tolerance mm

Tolerance cm3/1000 strokes	; +-	3.0
Check tolerance cm3/1000s. Spreed	: +	6.0
Tolerance cm3/1000 strokes	:	8.0
Check tolerance cm3/1000s.	:	12.0

:		450 1.740
:	+-	0.060
:	+-	0.060
:		26.0
:	+	3.0
:		6.0
:		10.0
	·	·

## STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	4.550
Del. quantity cm3/1000 strokes Tolerance	:	120.0
cm3/1000 strokes Check tolerance	: +-	20.0
cm3/1000s.	: +-	25.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil : 22.10.98 : ISO 4113

Combination No. : 0 402 696 805

Injection pump

Pump designation : PE6P12DA32DLS7922 EP type number : 0 412 626 975

Governor

Governer design. : RE30

Governer no. : 0 421 890 045

Cust. part No. : 9883189

Customer-spec. information

Customer : LIEBHERR

Motor

: D9406TI-EA4

Power KW

: 330.0

### TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

Tolerance °C

: +- 2.0

Overflow valve : 1 417 413 047

Inlet press. bar :

2.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

: 208.5

Tolerance bar : + 1.5

Test lines : 1 680 750 075

Outside diameter : 8.0

**8**SA

x inside diameter : 3.0 x length mm : 1000

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery

under Section C.

### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : ← 1.0

Prestroke mm : 3.65 Tolerance mm : ← 0.05 Check

tolerance mm : + 0.10

Rack travel in mm : 10.50 Tolerance mm :  $\leftarrow$  0.50

Firing order : 1-6-3-5-2-

Phasing : 0-60-120-180-240

: -300

Tolerance : ← 0.50

Check

tolerance \*NW : **←** 0.75

Start of delivery blocking

Tolerance : ← 0.10

Check

tolerance °NW : **←** 0.75

Barrel no. : 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION
Engine speed min-1: 0
Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05
Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25
Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check
tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25
Check tolerance mm : +/- 0.30
Stop position (P, R and H pump)
Uact V : Value with  deenergised adjusting magnet  and control rod in
stop position.  CRT mm : 0.75  Tolerance mm : +/- 0.25  Check
tolerance mm : +/- 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : + 0,065

CRT mm	: 1,00
Starting position (M pump) Uact V Tolerance Volt CRT mm Tolerance mm	: 4,500 : +- 0,115 : 19,00 : +- 0,80
ENGINE-SPEED SENS (All P and R pump H and M pumps)	
Test with control in stop position	. rod
Engine speed min- Amplitude V Tolerance V Check tolerance V	-1: 60 : 1.4 : +/- 0.6 : +/- 1.20
Engine speed min- Difference Amplitude to Amplitude V	: max.1.4
(C) INJECTION PUM	IP WITH POSITIONER
(C) INJECTION PUM TEST POINT V1	P WITH POSITIONER
	: 1050 : 3.000
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 1050 : 3.000 : 295.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes	: 1050 : 3.000 : 295.0 : +- 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS : 800 : 2.880
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000s. FUEL DELIVERY CHA	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS : 800 : 2.880 : 302.5

Rated speed rpm	:		550
Uact V	:		2.190
Del. quantity			
cm3/1000 strokes	;		207.0
Tolerance			
cm3/1000 strokes	:	+	4.0
Check tolerance			
cm3/1000s.	:	+-	6.0

Rated speed rpm	:	350	
Uact V	;	1.33	
Tolerance Volt	:	+- 0.06	0
Check tolerance			
Volt	:	+- 0.06	9
Del. quantity			
cm3/1000 strokes	:	15.	0
Tolerance			
cm3/1000 strokes	:	<b>←</b> 3.	0
Spreed			
Tolerance			
cm3/1000 strokes	:	8.	0
Check tolerance			
cm3/1000s.	:	12.	0

# STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.340
Del. quantity		
cm3/1000 strokes	:	150.0
Tolerance		
cm3/1000 strokes	: +-	10.0
Check tolerance		
cm3/1000s.	: +-	14.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 29.10.98 Test oil : ISO 4113 : 29.10.98

Combination No. : 0 402 196 717

Injection pump

Pump designation : PES6P120B720RS3409

EP type number : 0 412 026 812

Governor

Governer design. : RE30

Governer no. : 0 421 890 029

Cust. part No. : RE 502978

Customer-spec. information Customer : DEERE : 6081AT002 Motor

Power KW

: 135.0

## TEST BENCH REQUIREMENTS

Inlet line : 4.2

Test oil inlet

temp. °C Tolerance °C : +- 2.0

Overflow valve : 2 417 413 077

Inlet press. bar : 2.0Tolerance bar :  $\leftarrow$  0.1

Test nozzle holde

assembly : 1 688 901 101

Opening pressure

Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter: 3.0 x length mm : 600

### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting.

Setting of constant delivery under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 17.0 Tolerance bar : +- 1.0

Prestroke mm : 3.60 Tolerance mm : ← 0.05 Check

tolerance mm : + 0.10 Rack travel in mm : 10.50 Tolerance mm : + 1.50

Firing order : 1-5-3-6-2-

: 0-60-120-180-240 Phasing

: -300

Start of delivery mark

\*NW after s.o.d. : 7.00 : **←** 0.50 Tolerance

Check

: +- 0.75 tolerance °NW

: 1 Barrel no.

Beginning of delivery differende

and maximum rack

travel : 15.00
Tolerance mm : + 0.50
Difference ° CS : 2.50

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION

Engine speed min-1:

Setting point (P, R and H pump)

Uact V 3,100 CRT mm 13.00 Tolerance mm : +/- 0.05

Check

tolerance mm : +/- 0.10

Check value (P, R and H pump)

: 1.700 : 6.15 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30

Setting point (M pump)

Uact V 3.100 12.50 CRT mm : +/- 0.05 Tolerance mm Cneck

: +/- 0.10 tolerance mm

Check value (amuq M)

1.700 Uact V CRT mm 5.50 Tolerance mm : +/- 0.25

Check

tolerance mm : +/- 0.30

Stop position (P, R and H pump)

Uact V : Value with

> deenergised adjusting magnet and control rod in

> > stop position.

CRT mm 0.75 : +/- 0.25 Tolerance mm

Check

tolerance mm :  $\pm 1/-0.35$ 

Stop position (M pump)

Uact V 0,720 : + - 0.065Tolerance Volt CRT mm 1,00

Starting position

(M pump)

Uact V 4,500 Tolerance Volt : +- 0,115 CRT mm : 19,00 Tolerance mm : +- 0,80

ENGINE--SPEED SENSOR (All Pand R pumps not H and M pumps)

Test with control rod in stop position

Engine speed min-1: Amplitude V : 1.4 Tolerance V : +/- 0.6

Check

tolerance V : +/- 1.20

Engine speed min-1: 600

Difference Amplitude to

Amplitude V : max.1.4

## (C) INJECTION PUMP WITH POSITIONER

TEST POINT V1

Rated speed rpm : 1100 Uact V : 2.880

Del. quantity

cm3/1000 strokes : 140.0

Tolerance

cm3/1000 strokes :  $\leftarrow$  1.0

Check tolerance

cm3/1000s. 3.0 : +-

Spreed Tolerance

cm3/1000 strokes : 5.0

Check tolerance

9.0 cm3/1000s.

FUEL DELIVERY CHARACTERISTICS

Rated speed rpm : 700 2.880 Uact V

B04

Del. quantity cm3/1000 strokes Tolerance	
cm3/1000 strokes Check tolerance	: +- 3.0
cm3/1000s. Spr <del>ee</del> d	: +- 6.0
Tolerance cm3/1000 strokes Check tolerance	: 8.0
cm3/1000s.	: 12.0
Rated speed rpm Uact V	: 425 : 1.610
Del. quantity	
cm3/1000 strokes Tolerance	: 22.0
cm3/1000 strokes	: ← 3.0
Check tolerance cm3/1000S. Spreed	: ← 6.0
Tolerance cm3/1000 strokes	: 6.0
Check tolerance	
cm3/1000s.	: 10.0
TEST POINT L1	
Rated speed rpm	: 425
Jact V Tolerance Volt	: 1.610 : ← 0.060
Check tolerance	
Volt	: <del></del> 0.060
STARTING FUEL DEL	IVERY
Rated speed rpm	: 100
Jact V Del. quadraity	: 4.600
cm3/1000 strokes	: 105.0
Tolerance cm3/1000 strokes	: <del></del> 10.0
Check tolerance	
cm3/1000s.	: <b>←</b> 13.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 29.10.98 Test oil : ISO 4113

Combination No. : 0 402 196 718

Injection pump

Pump designation : PES6P120B720RS3409

EP type number : 0 412 026 812

Governor

Governer design. : RE30

Governer no. : 0 421 890 029

Cust. part No. : RE 502979

Customer-spec. information Customer : DEERE : 6081HRW02 : 163.0 Motor Power KW

### TEST BENCH REQUIREMENTS

Inlet line : 4.2

Test oil inlet

: 40 temp. °C Tolerance °C : +- 2.0

Overflow valve : 2 417 413 077

Inlet press. bar : 2.0Tolerance bar :  $\leftarrow 0.1$ 

Test nozzle holde

: 1 688 901 101 assembly

Opening pressure

: 208.5 bar Tolerance bar : ← 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : x length mm : 600

#### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 17.0 Tolerance bar : ← 1.0

Prestroke mm Tolerance mm 3.60 : **←** 0.05 Check

: +- 0.10 tolerance mm

Rack travel in mm : 10.50 Tolerance mm : +- 1.50

Firing order : 1-5-3-6-2-

: 4

Phasing : 0-60-120-180-240

: -300

Start of delivery blocking

\*Nw after s.o.d. : 7.75 Tolerance : ← 0.50 Check

tolerance °NW : +- 0.75

Barrel no. : 1

## Beginning of delivery differende

and maximum rack

travel : 15.00
Tolerance mm : + 0.50
Difference ° CS : 2.50

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION.

Engine speed min-1:

Setting point (P, R and H pump)

Uact V 3.100 13.00 CRT mm Toterance mm : +/- 0.05 Check

tolerance mm : +/- 0.10

Check value (P, R and H pump)

: 1.700 : 6.15 Uact V CRT mm Tolerance mm : +/- 0.25 Check

: +/- 0.30 tolerance mm

Setting point (m pump)

12.50 Uact V 3.100 CRT mm Tolerance mm : +/- 0.05

Check

: +/- 0.10 tolerance mm

Check value (qmuq M)

: 1.700 : 5.50 Uact V CRT mm Tolerance mm : +/- 0.25 Check

tolerance mm : +/- 0.30

Stop position (P, R and H pump)

: Value with Uact V

> deenergised adjusting magnet and control rod in

stop position.

0.75 CRT mm : +/- 0.25 Tolerance mm

Check

tolerance mm :  $\pm -0.35$ 

Stop position (M pump)

Uact V 0,720 : +- 0,065 Tolerance Volt 1,00 CRT mm

Starting position

(dmuq M)

Uact V 4,500 Tolerance Volt : + - 0,115CRT mm : 19,00 Tolerance mm : +- 0,80

ENGINE--SPEED SENSOR (All P and R pumps not H and M pumps)

Test with control rod in stop position

Engine speed min-1: Amplitude V : Tolerance V : + 1.4 : +/- 0.6

Check

tolerance V : +/- 1.20

Engine speed min-1: 600

Difference Amplitude to

Amplitude V : max.1.4

### (C) INJECTION PUMP WITH POSITIONER

TEST POINT V1

Rated speed rpm : 1100 Uact V 2.880

Del. quantity

cm3/1000 strokes : 140.0

Tolerance

cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance

cm3/1000s. : +-4.0

Spreed Tolerance

cm3/1000 strokes : 5.0

Check tolerance

9.0 cm3/1000s.FUEL DELIVERY CHARACTERISTICS

700 Rated speed rpm : 2.880 Uact V

**B07** 

Del. quantity cm3/1000 strokes Tolerance	: 141.5
cm3/1000 strokes	: <del></del> 3.0
Check tolerance cm3/1000S.	: +- 6.0
Spreed Tolerance	
cm3/1000 strokes	: 8.0
Check tolerance cm3/1000s.	: 12.0
Rated speed rpm	: 425
Uact V Del. quantity	: 1.610
cm3/1000 strokes Tolerance	: 22.0
cm3/1000 strokes Check tolerance	: ← 3.0
cm3/1000s. Spreed	: +- 6.0
Tolerance cm3/1000 strokes	: 6.0
Check tolerance cm3/1000s.	: 10.0
TEST POINT L1	
Rated speed rpm	
Uact V Tolerance Volt	: 1.610 : ← 0.060
Check tolerance	0.000
Volt	: ← 0.060
STARTING FUEL DEL	IVERY
Rated speed rpm	: 100
Uact V Del. quantity	: 4.600
cm3/1000 strokes	: 105.0
Tolerance cm3/1000 strokes	: +- 10.0
Check tolerance cm3/1000S.	: +- 13.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 05.11.98 : ISO 4113

Combination No. : 0 401 496 001

Injection pump

Pump designation : PE6R120/720RS1502

EP type number : 0 411 426 002

Governor

Governer design. : RE31

Governer no. : 0 421 890 200

Cust. part No. : 1556156

: -P07 v. 12/95

Customer-spec. information

Customer : VOLVO-TRUCK

Motor

: TD 163 ES,EJ

Power KW

: 370.0

## TEST BENCH REQUIREMENTS

Inlet line : 3.1

Overflow valve : 2 417 413 098

Test oil inlet

temp. °C

Tolerance °C

: <del>←</del> 2.0

Inlet press. bar :

Inlet press. bar : 2.5 Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

208.5

Tolerance bar : +- 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter :

3.0

x length mm :

600

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 31.0

Tolerance bar : +- 1.0

Prestroke mm : : +- 0.05 Tolerance mm

Check

: +- C.10 tolerance mm

Rack travel in mm : 10.50

Tolerance mm :  $\leftarrow$  0.50

5,40

: 1-5-3-6-2-Firing order

Phasing : 0-60-120-180-240

: -300

Tolerance : +- 0.50

Check

tolerance °NW : +- 0.75

Start of delivery mark

Tolerance : +- 0.50

Check

tolerance °NW : **←** 0.75

Barrel no.

: 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at

n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION
Engine speed min-1: 0
Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Stop position (P, R and H pump)
Uact V: Value with deenergised adjusting magnet and control rod in
stop position.  CRT mm : 0.75  Tolerance mm : +/- 0.25  Check tolerance mm : +/- 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : + 0,065

CRT mm	: 1,00
Starting position (M pump) Uact V Tolerance Volt CRT mm Tolerance mm	: 4,500 : + 0,115 : 19,00 : + 0,80
ENGINE-SPEED SENS (All P and R pump H and M pumps)	
Test with control in stop position	rod
Engine speed min- Amplitude V Tolerance V Check tolerance V	1: 60 : 1.4 : +/- 0.6 : +/- 1.20
Engine speed min- Difference Amplitude to Amplitude V	1: 600 : max.1.4
(C) INJECTION PUM	P WITH POSITIONER
(C) INJECTION PUM	P WITH POSITIONER
	: 550 : 2.950
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 550 : 2.950 : 395.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed	: 550 : 2.950 : 395.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes	: 550 : 2.950 : 395.0 : + 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance	: 550 : 2.950 : 395.0 : + 1.0 : + 4.0 : 6.0 : 10.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 550 : 2.950 : 395.0 : + 1.0 : + 4.0 : 6.0 : 10.0

Tolerance cm3/1000 strokes Check tolerance cm3/1000S.	: 9.0 : 13.0
Rated speed rpm Uact V Del. quantity	: 950 : 2.000 : 163.0
cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 163.0 : +- 3.0 : +- 6.0
TEST POINT L1	
Rated speed rpm Uact V Tolerance Volt Check tolerance	: 300 : 1.530 : ← 0.060
Volt	: +- 0.060
Del. quantity cm3/1000 strokes Tolerance	: 20.0
cm3/1000 strokes Spreed	: +- 3.0
Tolerance cm3/1000 strokes Check tolerance	: 7.0
cm3/1000s.	: 11.0

Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 05.11.98 Test oil : ISO 4113

Combination No. : 0 401 496 003

Injection pump

Pump designation : PE6R120/720RS1504 EP type number : 0 411 426 003

Governor

Governer design. : RE31

Governer no. : 0 421 890 200

Cust. part No. : 1556415

: <del>-P</del>10v20.11.96

Customer-spec. information

: VOLVO-TRUCK Customer

Motor : TD 164 Power KW : 382.0

TEST BENCH REQUIREMENTS

Inlet line : 3.2

Test oil inlet

40 temp. °C Tolerance °C : +- 2.0

Overflow valve : 2 417 413 098

Inlet press. bar : 2.5 Tolerance bar : ← 0.1

Test nozzle holde assembly : 1 688 901 105

Opening pressure

: 208.5 bar Tolerance bar :  $\leftarrow$  1.5

Test Lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0

x length mm : 600

REMARKS

Pump-specific values in Section (B)

must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : + 1.0

Prestroke mm : 5.45 Tolerance mm : + 0.05

Check

: +- 0.10 tolerance mm

Rack travel in mm : 10.50Tolerance mm :  $\leftarrow 0.50$ 

Firing order : 1-5-3-6-2-

: 0-60-120-180-240 Phasing

: -300

Tolerance : +- 0.30

Check

tolerance °NW : +- 0.75

Start of delivery mark

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 VTESTING & SETTING RACK TRAVEL SENSOR POSITION Engine speed min-1: 0 Setting point (P, R and H pump) Uact V CRT mm : 3.100 : 13.00 3.100 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value (P, R and H pump) CRT mm : 1.700 : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm :  $\pm -0.30$ Setting point (amua M) : 3.100 : 12.50 3.100 Uact V CRT mm Tolerance mm :  $\pm -0.05$ Check : +/- 0.10 tolerance mm Check value (qmuq M) : 1.700 : 5.50 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm :  $\pm -0.30$ Stop position (P, R and H pump) Uact V : Value with deenergised adjusting magnet and control rod in stop position. 0.75 CRT mm : +/~ 0.25 Tolerance mm Check

tolerance mm :  $\pm -0.35$ Stop position (M pump) Uact V 0,720 Tolerance Volt : + 0,065 1,00 CRT mm Starting position (amua M) Uact V 4,500 Tolerance Volt : +- 0,115 : 19,00 CRT mm Tolerance mm : +- 0,80 ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/-0.6Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 525 Rated speed rpm : Uact V 2.950 Del. quantity cm3/1000 strokes : 390.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes : 6.0 Check tolerance 10.0 cm3/1000s. FUEL DELIVERY CHARACTERISTICS 900 Rated speed rpm Uact V 3.240 Del. quantity cm3/1000 strokes : 386.0

Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: ← 3.0 : ← 6.0 : 9.0 : 13.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 900 : 2.000 : 163.0 : ← 3.0 : ← 6.6
Rated speed rpm Rated speed rpm Uact V Uact V Tolerance Volt Check tolerance Volt Del. quantity cm3/1000 strokes Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Tolerance cm3/1000 strokes Spreed Tolerance cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Check tolerance	: 265 : 265 : 1.630 : 1.630 : + 0.060 : + 0.060 : + 0.060 : 20.0 : + 3.0 : + 3.0 : + 3.0 : 7.0 : 7.0 : 11.0

### Note remarks

Refer to Service Info for test and adjustment instructions.
See microcard(s) W400/...

Edition : 05.11.98 Test oil : ISO 4113

Combination No. : 0 401 496 004

Injection pump

Pump designation : PE6R120/720RS1512 EP type number : 0 411 426 005

Governor

Governer design. : RE31

Governer no. : 0 421 890 202

Cust. part No. : 1556958

: <del>-P</del>02 v. 03/98

Customer-spec. information

Customer : VOLVO-TRUCK

Motor : TD 164 Power KW : 382.0

## TEST BENCH REQUIREMENTS

Inlet line : 3.2

Test oil inlet

temp. °C : +0Tolerance °C : +-2.0

Overflow valve : 2 417 413 098

Inlet press. bar : 2.5 Tolerance bar : + 0.1

Test nozzle holde

assembly : 1 688 901 105

Opening pressure

bar : 208.5 Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0
x length mm : 600

### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery

under Section C.

#### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : + 1.0

Prestroke mm : 5.45 Tolerance mm : +- 0.05

Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50 Tolerance mm : +- 0.50

Firing order : 1-5-3-6-2-

: 4

Phasing : 0-60-120-180-240

: -300

Tolerance : +- 0.50

Check

tolerance  $^{\circ}NW$  :  $\leftarrow$  0.75

Start of delivery mark

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1	+ CRT mm : 0.75 + Tolerance mm : +/- 0.25 - Check + tolerance mm : +/- 0.35
(B) POSITIONER TESTING Warm—up time: 3 minutes at n=600 min−1, Uact = 2.5 V	Stop position (M pump) Uact V : 0,720 Tolerance Volt : + 0,065 CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR POSITION  Engine speed min-1: 0	Starting position (M pump) Uact V : 4,500
Setting point (P, R and H pump)	(M pump)  Uact V : 4,500  Tolerance Volt : +- 0,115  CRT mm : 19,00  Tolerance mm : +- 0,80
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10	ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps)
Check value (P, R and H pump)	Test with control rod in stop position  Engine speed min-1: 60
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check	Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20
tolerance mm : +/- 0.30  Setting point	Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4
(M pump)	Amperedde V . max.1.4
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check	(C) INJECTION PUMP WITH POSITIONER TEST POINT V1
tolerance mm : +/- 0.10  Check value (M pump)	Rated speed rpm : 525 Uact V : 2.950 Del. quantity cm3/1000 strokes : 390.0
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check	Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. : +- 4.0
tolerance mm : +/- 0.30  Stop position (P, R and H pump)	Spreed Tolerance cm3/1000 strokes: 6.0 Check tolerance
Uact V: Value with deenergised adjusting magnet and control rod in stop position.	cm3/1000s. : 10.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 900

Uact V	: 3.240
Del. quantity cm3/1000 strokes	: 385.0
Tolerance cm3/1000 strokes	: <del>-</del> 3.0
Check tolerance	
cm3/1000s. Spreed	: +- 6.0
Tolerance	2.0
cm3/1000 strokes Check tolerance	: 9.0
cm3/1000s.	: 13.0
Rated speed rpm	: 900
Uact V	2.000
Del. quantity cm3/1000 strokes	: 159.0
Tolerance cm3/1000 strokes	
Check tolerance	
cm3/1000s.	: ← 6.0
TEST POINT L1	
Rated speed rpm	: 265
Rated speed rpm Uact V	: 265 : 1.630
Uact V	: 1.630
Tolerance Volt	: <b>←</b> 0.060
Check tolerance Volt	: +- 0.060
Del. quantity cm3/1000 strokes	: 19.0
Del. quantity	. 17.0
cm3/1000 strokes	: 20.0
Tolerance cm3/1000 strokes	: <del>+-</del> 3.0
Tolerance	
cm3/1000 strokes Spreed	: +- 3.0
Tolerance	3.5
cm3/1000 strokes Tolerance	: 7.0
cm3/1000 strokes	: 7.0
Check tolerance	44.0
cm3/1000S. Check tolerance	: 11.0
cm3/10COS.	: 11.0

Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil : 05.11.98 : ISO 4113

Combination No. : 0 402 896 009

Injection pump

Pump designation : PE6P120A320RS8020 EP type number : 0 412 826 021

Governor Governer design. : RE30

Governer no. : 0 421 890 010

Cust. part No. : 479889-P03 V.08/95

Customer-spec. information

Customer : VOLVO-TRUCK

: TD123,TD103 E ES Motor

Power KW : 290.0

TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

40 temp. °C Tolerance °C : +- 2.0

Overflow valve : 2 417 413 098

Inlet press. bar : 2.5 Tolerance bar : + 0.1

Test nozzle holde

: 1 688 901 103 assembly

Opening pressure

208.5 bar Tolerance bar : +- 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

x inside diameter :
x length mm : 600

2.0 600

REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

BEGINNING OF DELIVERY

Test pressure bar : Tolerance bar : + 1.0

Prestroke mm : 4.05 Tolerance mm : +- 0.05 Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50 Tolerance mm : ← 0.50

: 1-5-3-6-2-Firing order

: 4

Phasing : 0-60-120-180-240

: -300

Tolerance : +- 0.50

Check

: +- 0.75 tolerance °NW

Start of delivery mark

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR

**POSITION** 

Engine speed min-1:

Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance min : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Stop position (P, R and H pump)
Uact V: Value with deemergised adjusting magnet and control rod in stop position.
CRT mm : 0.75 Tolerance mm : +/- 0.25 Check
tolerance mm : +/- 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : + 0,065 CRT mm : 1,00
Starting position (M pump)

: 4,500

Tolerance Volt : +- 0,115 CRT mm : 19,00 Tolerance mm : +- 0,80 **ENGINE-SPEED SENSOR** (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60
Amplitude V : 1.4
Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 600 : 2.800 Uact V Del. quantity cm3/1000 strokes : 302.0 Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance : +- 4.0 cm3/1000\$. Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. 11.0 FUEL DELIVERY CHARACTERISTICS Rated speed rpm : 950 Uact V 2.800 Del. quantity cm3/1000 strokes : 258.0 Tolerance cm3/1000 strokes :  $\leftarrow$  3.0 Check tolerance cm3/1000s. : +- 6.0 Spreed Tolerance cm3/1000 strokes : 10.0Check tolerance : 14.0 cm3/1000s.

Uact V

Rated speed rpm	;		950
Uact V	:		2.200
Del. quantity			
cm3/1000 strokes	:		183.0
Tolerance			
cm3/1000 strokes	;	+-	3.0
Check tolerance			
cm3/1000s.	:	+-	6.0

# TEST POINT L1

Rated speed rpm	:		250
Uact V	:		1.400
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.060
Del. quantity			
cm3/1000 strokes	:		22.0
Tolerance			
cm3/1000 strokes	:	+-	2.0
Spreed			
Tolerance			
cm3/1000 strokes	•		5.0
Check tolerance	Ċ		
cm3/1000s.			9 N
CIII.27 10003.	:		8.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 05.11.98 Test oil : ISO 4113

Combination No. : 0 402 896 015

Injection pump

Pump designation : PE6P120A320RS8033

EP type number : 0 412 826 031

Governor

Governer design. : RE30

Governer no. : 0 421 890 027

Cust. part No. : 425758 PO5 v. 11/95

Customer—spec. information

Customer : VOLVO-TRUCK

Motor

: DH 10 A

Power KW

: 265.0

#### TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

Tolerance °C

: 40 : +- 2.0

Overflow valve : 2 417 413 097

Inlet press. bar : Inlet press. bar : 3.0 Tolerance bar : + 0.1

3.0

Test nozzle holde

assembly

: 1 688 901 103

Opening pressure

bar

208.5

Tolerance bar : ← 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

x inside diameter: 2.0 x length mm : 600

REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

BEGINNING OF DELIVERY

Test pressure bar :

Tolerance bar : + 0.2

Prestroke mm 4,40

Tolerance mm : <del>←</del> 0.05

Check

: +- 0.10 tolerance mm

Rack travel in mm : 10.50Tolerance mm :  $\leftarrow 0.50$ 

Firing order

: 1-5-3-6-2-

Phasing : 0-60-120-180-240

: -300

: **←** 0.50 Tolerance

Check

tolerance °NW : + 0.75

Start of delivery mark

Tolerance : +- 0.50

Check

tolerance °NW : **←** 0.75

Barrel no.

: 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at

n=600 min-1, Uact = 2.5 V

B21

TESTING & SETTING RACK TRAVEL SENSOR **POSITION** Engine speed min-1: Setting point (P, R and H pump) Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value (P, R and H pump) : 1.700 : 6.15 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Setting point (amuq M) Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value (amuq M) : 1.700 : 5.50 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm :  $\pm -0.30$ Stop position (P, R and H pump) Uact V : Value with deenergised adjusting magnet and control rod in stop position. 0.75 CRT mm Tolerance mm : +/- 0.25 Check : +/- 0.35 tolerance mm Stop position (M pump) Uact V : 0,720

CRT mm : 1,00 Starting position (qmuq M) : 4,500 Uact V Tolerance Volt : +- 0,115 CRT mm : 19,00 Tolerance mm : **←** 0,80 ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 600 Uact V 2.800 Del. quantity cm3/1000 strokes : 295.0 Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance cm3/1000S. : +- 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. FUEL DELIVERY CHARACTERISTICS Rated speed rpm : 950 Del. quantity 2.800 cm3/1000 strokes : 252.0 Tolerance cm3/1000 strokes :  $\leftarrow$  3.0 Check tolerance : +- 6.0 cm3/1000s. Spreed

Tolerance Volt : + 0,065

Tolerance cm3/1000 strokes	:	10.0
Check tolerance cm3/1000s.	:	14.0

Rated speed rpm Uact V	:	950 2,200
Del. quantity cm3/1000 strokes		178.0
Tolerance cm3/1000 strokes	· · +-	
Check tolerance cm3/1000s.	· ·	- 6.0

# TEST POINT L1

Rated speed rpm	:		250
Uact V	:		1.470
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.060
Del. quantity			
cm3/1000 strokes	:		21.0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000S.	:		8.0

## Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 05.11.98 : ISO 4113

Combination No. : 0 402 896 016

Injection pump

Pump designation : PE6P120A320RS8034

EP type number : 0 412 826 032

Governor

Governer design. : RE30

Governer no. : 0 421 890 028

Cust. part No. : 8194088 P06 v.02.98

Customer-spec. information

Customer : VOLVO-TRUCK

Motor

: D 10, DH 10

Power KW

: 265.0

### TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

40

Tolerance °C

÷ + 2.0

Overflow valve : 2 417 413 097

Inlet press. bar : 3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 103

Opening pressure

bar

208.5

Tolerance bar : +- 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

x inside diameter : 2 x length mm : 600 2.0

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

#### BEGINNING OF DELIVERY

Test pressure bar : 3.0 Tolerance bar : +- 0.2

Prestroke mm : 4.40 Tolerance mm : + 0.05

Check

tolerance mm: : + 0.10

Rack travel in mm : 8.50

Tolerance mm

: **←** 0.50

Firing order : 1-5-3-6-2-

: 4

Phasing

: 0-60-120-180-240

: -300

Tolerance Check

: +- 0.50

tolerance °NW

: +- 0.75

## Start of delivery mark

Tolerance

: +- 0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK POSITION	TRAVEL SENSOR
Engine speed min-1:	0
Setting point (P, R and H pump)	
CRT mm : +/-	3.100 13.00 - 0.05
Check tolerance mm : +/-	- 0.10
Check value (P, R and H pump)	
Uact V : CRT mm : Tolerance mm : +/-	1.700 6.15 0.25
Check tolerance mm : +/-	
Setting point (M pump)	
Uact V : CRT mm : Tolerance mm : +/- Check	3.100 12.50 · 0.05
tolerance mm : +/-	0.10
Check value (M pump)	
Uact V : CRT mm : Tolerance mm : +/-	1.700 5.50 0.25
Check tolerance mm : +/-	0.30
Stop position (P, R and H pump)	
deenergised and	ue with adjusting magnet control rod in
CRT mm :	p position. 0.75 0.25
Check tolerance mm : +/-	
Stop position (M pump)	
Uact V : Tolerance Volt : +-	0,720 0,065

CRT mm	: 1,00
	,55
Starting position	
(M pump)	
Uact V	: 4,500
Tolerance Volt	: +- 0,115
CRT mm	: 19,00
Tolerance mm	: +- 0,80
ENGINE-SPEED SENS	
(All P and R pump	s not
H and M pumps)	
	•
Test with control	roa
in stop position	
Engine speed min-	1. 60
Amplitude V	· 1 4
Engine speed min- Amplitude V Tolerance V	· +/= 0.6
Check	,
tolerance V	: +/- 1.20
Engine speed min-	1: 600
Difference	
Amplitude to	
Amplitude V	: max.1.4
(C) THE CTTON CHAIN	D LITTLE DOCUTIONED
(C) INJECTION PUM	P WITH POSITIONER
	P WITH POSITIONER
(C) INJECTION PUMI	
TEST POINT V1	
TEST POINT V1 Rated speed rpm	
TEST POINT V1 Rated speed rpm Uact V	
TEST POINT V1 Rated speed rpm	: 600 : 2.800
TEST POINT V1 Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance	: 600 : 2.800 : 303.0
TEST POINT V1 Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 600 : 2.800
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance	: 600 : 2.800 : 303.0 : +- 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 600 : 2.800 : 303.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed	: 600 : 2.800 : 303.0 : +- 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes	: 600 : 2.800 : 303.0 : +- 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS : 950 : 2.800
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS : 950 : 2.800
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS : 950 : 2.800 : 261.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAR	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 RACTERISTICS : 950 : 2.800 : 261.0

Tolerance	
cm3/1000 strokes	: 10.0
Check tolerance cm3/1000s.	: 14.0
Ciii37 10003.	. 14.0
	050
Rated speed rpm	: 950
Uact V	: 2.200
Del. quantity cm3/1000 strokes	: 184.0
Tolerance	. 104.0
cm3/1000 strokes	: +- 3.0
Check tolerance	
cm3/1000S.	: ← 6.0
TEST POINT L1	
Rated speed rpm	: 250
Uact V	: 1.470
Tolerance Volt	: +- 0.060
Check tolerance	
Volt	: <b>←</b> 0.060
Del. quantity	
cm3/1000 strokes	: 22.0
Tolerance	: <b>←</b> 3.0
cm3/1000 strokes Spreed	; +- 3.0
Tolerance	
cm3/1000 strokes	: 5.0
Check tolerance	. 2.0
cm3/1000S.	: 8.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition

: 05.11.98 Test oil : ISO 4113

Combination No. : 0 402 896 020

Injection pump

Pump designation : PE6P120A320RS8057 EP type number : 0 412 826 041

Governor

Governer design. : RE30

Governer no. : 0 421 890 028

Cust. part No. : 8194566 PO1 v.02.98

Customer-spec. information

Customer : VOLVO-TRUCK

Motor Power KW : D 10 : 265.0

### TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

40

Tolerance °C

: +- 2.0

Overflow valve : 2 417 413 097

Inlet press. bar : 3.0Tolerance bar :  $\leftarrow$  0.1

Test nozzle holde

assembly

: 1 688 901 103

Opening pressure

bar

208.5

Tolerance bar : + 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

B27

x inside diameter :

2.0

x length mm : 600

## **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : Tolerance bar : + 0.2

Prestroke mm : 4.40 Tolerance mm : ← 0.05

Check

tolerance mm : + 0.10

Rack travel in mm : 8.50

Tolerance mm : +- 0.50

Firing order : 1-5-3-6-2-

Phasing

: 0-60-120-180-240

: -300

Tolerance

: +- 0.50

Check

tolerance °NW : +- 0.75

## Start of delivery mark

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW

: +- 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at

n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR	1
POSITION	+ Starting position
7 002 1 2017	(M. pump)
Engine speed min-1: 0	I lact V · 4 500
engine speed with-1.	Uact V : 4,500 Tolerance Volt : + 0,115
Catting maint	T toterance vott . += 0,113
Setting point	+ CRT mm : 19,00
(P, R and H pump)	+ Tolerance mm   : +- 0,80
7.400	†
Uact V : 3.100	†
CRT mm : 13.00	+ ENGINE-SPEED SENSOR
Tolerance mm : +/- 0.05	+ (All P and R pumps not
Check	+ Hand M pumps)
tolerance mm : +/- 0.10	+
	+ Test with control rod
Check value	† in stop position
(P, R and H pump)	+
	+ Engine speed min-1: 60
	Amplitude V : 1.4 Tolerance V : +/- 0.6
Uact V : 1.700	
CRT mm : 6.15	+ Check
Tolerance mm : +/- 0.25	+ tolerance V : +/- 1.20
Check	+
tolerance mm : +/- 0.30	+ Engine speed min-1: 600
	+ Difference
	+ Amplitude to
Setting point	+ Amplitude V . max.1.4
(M pump)	
W. Famer	1
Uact V : 3.100	
Uact V : 3.100 CRT mm : 12.50	(c) INJECTION PUMP WITH POSITIONER
Tolerance mm : $\pm -0.05$	
Tolerance mm : +/- 0.05	+
Tolerance mm : +/- 0.05 Check	TEST POINT V1
Tolerance mm : +/- 0.05	TEST POINT V1
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10	TEST POINT V1 Rated speed rpm : 600
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value (M pump)	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000s : + 4.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000s : + 4.0  Spreed
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000s : + 4.0  Spreed  Tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000S : 11.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000S : 11.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000S : + 4.0  Spreed  Tolerance  cm3/1000 strokes : 8.0  Check tolerance  cm3/1000S : 11.0  FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950  Uact V : 2.800  Del. quantity
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000S : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000S : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000S : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : 4.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : + 3.0 Check tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position (M pump)	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : + 3.0 Check tolerance cm3/1000 strokes : + 3.0 Check tolerance cm3/1000s : + 6.0
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position (M pump) Uact V : 0,720	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : + 3.0 Check tolerance
Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position (M pump)	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : + 3.0 Check tolerance cm3/1000 strokes : + 3.0 Check tolerance cm3/1000s. : + 6.0

Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	:	10.0 14.0
Rated speed rpm	:	950

Rated speed rpm Uact V	:		950 2,200
Del. quantity cm3/1000 strokes	:		184.0
Tolerance cm3/1000 strokes	:	+-	3.0
Check tolerance cm3/1000s.	:	+	6.0

# TEST POINT L1

Rated speed rpm	:	250
Uact V	:	1.470
Tole-ance Volt	:	<b>←</b> 0.060
Check tolerance		
Volt	:	<b>←</b> 0.060
Del. quantity		
cm3/1000 strokes	:	22.0
Tolerance		
cm3/1000 strokes	:	<del>←</del> 3.0
Spreed		
Tolerance		
cm3/1000 strokes	:	5.0
Check tolerance		
cm3/1000S.	:	8.0